REMARKS

Claims 1-28 are pending in the present application, of which claims 1 (method), 2 (system), 3 (system) and 16 (computer program product) are independent claims. Independent claims 1-3 and 16 have been cancelled and replaced by independent claims 29-32. Since the total number of claims and the total number of independent claims remains unchanged, no additional claim fees are due as a result of the amendments made herein.

Additionally, dependent claims 4-15 and 17-26, and 28 were amended for clarification or merely to correct their dependencies in view of new claims 31 and 32. No new matter has been added by these amendments.

101 Rejections

Claims 1-28 were rejected under 35 U.S.C. 101 as being non-statutory subject matter. In the view of the Office Action, such claims "fail to provide a tangible result with a practical application by either:

1)   transforming (physical thing); or

2)   by having the FINAL RESULT (not steps) achieve or produce a useful (specific, substantial, and credible), concrete (substantially repeatable/ non-unpredictable), and tangible (real world/ non-abstract) result."

In short, the Office Action asserts that the claims represent a "mathematical algorithm that is abstract in nature. A problem is a mathematical algorithm. ... Submitting a query, providing responses, and submitting solutions are not results that are practical applications."

Independent claims 1-3 have been cancelled and replaced by new independent claims 29-31, respectively. Similarly, independent claim 16 has been cancelled and replaced by new independent claim 32. Each of claims 29-32 includes storing data, generating natural language queries, searching databases, and obtaining a tangible result in the form of a set of solution suggestions based on an original problem identification – all performed in a computer system. These claims represent systems, methods and computer program products directed to practical applications, and which produce tangible

results. For example, all claims include aspects of data reading, analysis, manipulation, and storage, communication with databases, and generation and storage of new data in the form of a set of solution suggestions. Systems, methods, and computer program products are particularly useful, for example, in engineering environments – where system analysis and related problem resolution is commonplace and advances can yield significant benefits, including improved quality, lower costs, and time savings.

Therefore, it is believed that independent claims 29-32 and their respective dependent claims 4-15 and 17-28 are directed to patentable subject matter. Accordingly, removal of the rejections under 35 USC 101 is requested.

102 Rejections

Claims 1-28 have been rejected under 35 USC 102 as being anticipated by US Pat. Pub. No. 2002/0120651 to Putejovsky *et al.* (referred to as "Putejovsky1"). Since independent claims 1-3 and 16 have been cancelled and replaced by new independent claims 29-32, respectively, Applicant's remarks will be directed to new claims 29-32.

As will be discussed below, Putejovsky1 does not, for example, anticipate the query formatter or formations of the claims of the present application. Putejovsky1 requires <u>input</u> of a natural language query, whereas the present invention generates a natural language query from other information. Putejovsky1 requires a natural language query as <u>a starting point</u>, else no processing is done.

The Office Action variously cites US Pat. Pub. No. 2001/0037328 to Putejovsky *et al.* (referred to as "Putejovsky2"). Putejovsky2 is similar to Putejovsky1 in that it also requires a user to input a query. In fact, the very first sentence of Putejovsky2, in its Abstract, says "A query is received via a computer user interface." FIG. 1 of Putejovsky2 also shows this. Like Putejovsky1, Putejovsky2 also requires a natural language query as <u>a starting point</u>.

Applicant notes that the amended claims further clarify inventive aspects simply not present in Pustejovsky1, or in Putejovsky2 for that matter. Given that Putejovsky1 is presented as the primary 102 reference, Applicant's remarks with be primarily directed thereto.

Claim 29

    Claim 29 has been amended and now reads:

        29. A method of obtaining solution suggestions for problems, the method implemented in a computer system having at least one processor and data storage medium, said method comprising:

        analyzing a system model, including identifying a problem to be solved and generating a machine representation of a problem statement representing the problem;

        reformulating the machine representation of the problem statement into a natural language or Boolean query; and

        accessing at least one knowledge base having problem solutions stored therein, and automatically obtaining a set of solution suggestions from the at least one knowledge base responsive to the query.

    Claim 29, as compared with original claim 1, provides greater detail with respect to problem identification and query formation. The steps pertaining thereto are not taught or implied by Pustejovsky1.

    A fundamental difference between Pustejovsky1 and claim 29 relates to the formation of a natural language or Boolean query. In Pustejovsky1 a <u>user input</u> natural language query is <u>a starting point</u>. Processing is then performed on the user input natural language query to turn it into a semantic representation so that a search can be performed. And Pustejovsky1 makes no mention of forming Boolean queries.

    Specifically, in Pustejovsky1, the user inputs a natural language query. If the natural language query is not a textual input, e.g., a voice input, then the non-textual input is converted into a natural language textual input. "This textual query would go through the stages including <u>tagging</u> and <u>tokenization</u> ... and would produce a semantic representation. (*Pustejovsky1*, para. 0041 – 0042) The semantic representations are then used for searching.

    Pustejovsky1 describes the process of getting from a user input natural language query (TEXT 243) to a semantic expression as follows in para. 34 and FIG. 2:

software engine **232**. The engine **232** has a tokenizer **231**, which is adapted to receive a stream of text information and separates the stream of text information (e.g., text book, query) into a plurality of tokens. The engine also includes a tagger **233** coupled to the tokenizer that is adapted to tag each token. A stemmer **235** coupled to the tagger also is included. The stemmer is adapted to stem each of the tagged tokens. The interpreter is coupled to the stemmer. The interpreter **237** is adapted to form an object including syntactic information and semantic information from each of the stemmed, tagged tokens. The engine also has control
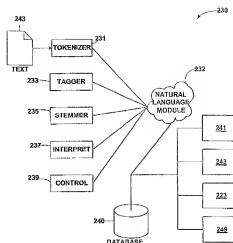
In contrast, note that in claim 29 a natural language query is not user input, like TEXT 243, but rather is generated from other information. In claim 29 a natural language query is a result on novel processing, which starts with a system model from which a problem statement is generated. THEN, a natural language query is automatically generated (i.e., not user input). The automatically generated natural language query in claim 29 is then used by a knowledge base to obtain a set of solution suggestions.

Pustejovsky1 is completely silent on generating a natural language or Boolean query as in claim 29; Putejovsky2 is similar in that regard since it also requires input of a natural language query from a user. More particularly, Pustejovsky1 is completely silent on any automated approach to generating TEXT 243. It is further silent on generating TEXT 243 as provided in claim 29, i.e., as follows:

> analyzing a system model, including identifying a problem to be solved and generating a machine representation of a problem statement representing the problem;
> reformulating the machine representation of the problem statement into a natural language or Boolean query;

Accordingly, Applicant contends that Pustejovsky1 does not anticipate each and every element of claim 29, nor does Putejovsky2. Allowance of claim 29 is requested.

Claim 30

Claim 30 is an independent system claim that includes elements corresponding to those of claim 29, e.g., as follows:

> a problem analysis tool configured to generate a machine representation of the problem statement;
> a query formatter configured to reformulate the machine representation of the problem statement into a natural language or Boolean query;

As with claim 29, the system of claim 30 generates a natural language or Boolean query, rather than expecting a natural language query as an input from a user. That is, the system of claim 30 generates a natural language or Boolean query from a problem statement, which was generated from a system model. Again, a user does not input a natural language query such as TEXT 243 taught by Pustejovsky1.

Accordingly, Applicant contends that Pustejovsky1 does not anticipate each and every element of claim 30, nor does Putejovsky2. Allowance of claim 30 is requested.

Claim 31

Claim 31 is an independent system claim that includes elements corresponding to those of claims 29 and 30, e.g., as follows:

> a problem analysis tool configured to analyze a system model to identify a problem to be solved and to generate a machine representation of a problem statement representing the problem;
> a query formatter configured to reformulate the machine representation of the problem statement into a natural language query;

As with claims 29 and 30, the system of claim 31 generates a natural language query, rather than expecting such an input from a user. That is, the system of claim 31 generates a natural language query from a problem statement, which was generated from a system model. Again, a user does not input a natural language query such as TEXT 243 taught by Pustejovsky1.

Accordingly, Applicant contends that Pustejovsky1 does not anticipate each and every element of claim 31, nor does Putejovsky2. Allowance of claim 31 is requested.

Claims 4-15

Claims 4-15 depend from claim 31 above. As such, since claim 31 is not anticipated by Pustejovsky1, Pustejovsky1 does not anticipate each and every element of claims 4-15, nor does Pustejovsky2. Reconsideration and removal of the rejections to claims 4-15 is requested.

With respect to claim 4, for example, since Pustejovsky1 does not teach the system of claim 31, it does not teach the system of claim 4 "wherein the query formatter is configured to translate functional relationships in the machine representation of the problem statement into semantic relationships." Pustejovsky1 does not include a query formatter as in the present invention, so cannot provide a query formatter configured as above, nor does Pustejovsky2.

With respect to claim 5, for example, since Pustejovsky1 does not teach the system of claim 31, it does not teach the system of claim 5 "wherein the query formatter is configured to reformulate the problem statement into a natural language query or a Boolean query." Pustejovsky1 does not include a query formatter as in the present invention, so cannot provide a query formatter configured as above, nor does Pustejovsky2. And Putejovsky1 does not teach reformulating problem statements into Boolean format queries, nor does Putejovsky2.

With respect to claim 13, for example, since Pustejovsky1 does not teach the system of claim 31, it does not teach the system of claim 13 wherein "the problem analysis tool is configured to determine functional relationships between key elements of the system model; and the query formatter is configured to reformulate the machine representation of the problem statement by translating the functional relationships into the natural language query." Pustejovsky1 does not include a query formatter as in the present invention, so cannot provide a query formatter configured as above, nor does Pustejovsky2.

With respect to claim 14, for example, since Pustejovsky1 does not teach the system of claim 31, it does not teach the system of claim 14 wherein "the problem analysis tool is configured to perform a root cause analysis of the system model that establishes one or more nodes and the query formatter is configured to translate the one or more nodes into the natural language query." Pustejovsky1 does not include a query formatter as in the present invention, so cannot provide a query formatter configured as above, nor does Pustejovsky2.

Claims 17-28

Claims 17-28 depend from claim 32 above. As such, since claim 32 is not anticipated by Pustejovsky1, Pustejovsky1 does not anticipate each and every element of claims 17-28, nor does Pustejovsky2. Reconsideration and removal of the rejections to claims 17-28 is requested.

Claim 17 was rejected on the same grounds as claim 4; claim 18 was rejected on the same grounds as claim 6; claim 19 was rejected on the same grounds as claim 7; claim 20 was rejected on the same grounds as claim 8; claim 21 was rejected on the same grounds as claim 9; claim 22 was rejected on the same grounds as claim 10; claim 23 was rejected on the same grounds as claim 11; claim 24 was rejected on the same grounds as claim 12; claim 25 was rejected on the same grounds as claim 13; claim 26 was rejected on the same grounds as claim 14; and claim 27 was rejected on the same grounds as claim 15. For the reasons put forth above with respect to claims 4 and 6-15, claims 17-27 are similarly not anticipated by Pustejovsky1, nor are they anticipated by Pustejovsky2.

For these additional reasons, reconsideration and removal of the rejections to claims 17-27 is requested.
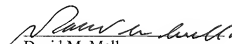
Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Authorization is hereby given to charge Deposit Account No. 501798 in the amount of $60.00 to cover the one month extension of time fee for a small entity. Authorization is also given to charge Deposit Account No. 501798 for any additional fees which may be due or to credit any overpayment.

Respectfully submitted,

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